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Factor Structure and Criterion Validity of an Enlarged Version of the Parental Bonding Instrument

Luigi Cappelli

Università degli studi di Roma Tor Vergata, Italia

Valeria Verrastro

Università degli studi di Cassino e del Lazio Meridionale, Italia

Irene Petruccelli

Università Kore di Enna, Italia

Pierluigi Diotaiuti, Filippo Petruccelli

Università degli studi di Cassino e del Lazio Meridionale, Italia

Francesco Dentale*, Pietro San Martini

Università degli studi di Roma La Sapienza, Italia

Abstract

Factorial structure and criterion validity of an enlarged version of the Parental Bonding Instrument (PBI-E) were evaluated in a community sample of young adults. This enlarged version was obtained by adding parental favouritism (FAV) and put-down/shaming (PUT_D) to the original care and overprotection (OV) scales as recalled by the offspring. Factor analysis suggested a five factor model as the best solution, identifying CARE, FAV and PUT_D and splitting the overprotection items into two factors, denial of psychological autonomy (DPA) and discouragement of behavioural freedom, (DBF) with Cronbach's alphas ranging from .77 to .92. These five scales were correlated with depression and anxiety of the offspring, measured by BDI and STAI. Both of them correlated negatively with care and positively with the other parental scales, as expected by Parker's theory on the role of affectionless control for the psychopathological vulnerability of the children. A series of hierarchical regression analyses, including CARE, DPA and DBF at the first step and FAV and PUT_D at the second step, showed that the latter enhanced the predictive power of the instrument. Overall these findings: (1) suggest a five factor structure for the PBI-E and (2) confirm the criterion validity of the PBI scales in respect to children's depression and anxiety, providing also compelling evidence for the incremental validity of Gilbert's scales.

Key words: PBI, favouritism, put-down/shaming scales, criterion validity of PBI.

Novelty and Significance

What is already known about the topic?

- Parker's theory on the pathogenic effect of the affectionless control as a rearing style (i.e. low care and high overprotection).
- Factorial structure of the original PBI with two rearing dimensions: Care and Overprotection.
- Correlations of parental Care and Overprotection with children's depression.

What this paper adds?

- Investigates the factorial structure of an enlarged version of the PBI (PBI-E) that includes, not only the original items, but also two additional scales proposed by Gilbert (Put-Down/Shaming and Favouritism), aimed at extending the conceptual framework of affectionless control.
- Examines the pattern of correlations of PBI-E not only with depression but also with anxiety, as a further outcome of children's well-being.
- Tests if the added Gilbert's scales increase the predictive power of the PBI scales on depression and anxiety in the offspring.

* Correspondence concerning this article: Francesco Dentale, Dipartimento di Psicologia, Università degli studi di Roma La Sapienza, Via dei Marsi 78, 00185 Roma, Italia. E-mail: francesco.dentale@libero.it

In the context of the attachment theory (e.g. Bowlby, 1977a, b) it is generally acknowledged that parents lacking in the capacity to offer a secure base and to encourage explorative behaviours, tend to create in children an anxious attachment that makes them prone to psychopathology. In order to study the relationship between family environment and psychopathological vulnerability in a quantitative manner, several instruments of parental rearing have been developed based on the memories of the offspring such as the *Children's Reports of Parental Behavior Inventory* (CRPBI, Schaefer, 1965), the *Egna Minnen Betraeffande Unde Uppfostran* ("My growth memories", EMBU, Perris, Jacobson, Lindstrom, Van Knorring, & Perris, 1980) and the *Parental Bonding Instrument* (PBI, Parker, Tupling & Brown, 1979; Parker, 1989; Cappelli & San Martini, 2004, for the Italian version). A comprehensive review of the literature on the use of retrospective reports in the assessment of parental behaviour (Brewin, Andrews, & Gotlib, 1993) showed that such measures are more reliable than generally thought and concluded for their substantial utility and validity. These questionnaires appear to be simple and easy to handle, permitting to avoid complex problems typically connected to the interview methods (e.g. training of the judges and assessment of their reliability).

In a series of studies on the influence of parental rearing style on the psychological vulnerability of the offspring, Parker identified a pattern of dysfunctional parenting, called *affectionless control*, characterised by low *care* and high *overprotection* (Parker, 1979, 1981, 1983, 1984). At the positive pole care refers to affect, emotional warmth, empathy and intimacy, while at the negative pole to coldness, indifference and refusal. Similarly at the positive pole overprotection refers to the tendency to promote behavioural and psychological autonomy, at the negative pole to control, intrusiveness and inhibition of independence. As a measure of these dimensions he developed the above mentioned PBI, that has been showed to be a valid and reliable measure of parenting behaviours as perceived by the offspring. Many studies have generally confirmed Parker's theory, particularly as regards the risk of depression and anxiety of the children with affectionless control parents (e.g. Safford, Alloy, & Pieracci 2007; Gladstone & Parker, 2005).

As regards the factor structure of the PBI, a large discussion emerged on the opportunity to parsed the overprotection scale in two different sub-dimensions correlated with each other. Some authors (Kendler, 1996; Sato, Narita, Hirano, Kusunoki, Sakado, & Uehara, 1999; Cox, Enns, & Clara, 2000; Heider, Matschinger, Vilagut, Martínez Alonso, Dietrich, & Angermeyer, 2005) proposed to distinguish between *protectiveness* and *authoritarianism*, others between *overprotection* and *restraint* (Gómez Beneyto, Pedrós, Tomás, Aguilar, & Leal, 1993) or also between *protection-personnel domain* and *protection-social domain* (Cubis, Lewin, & Dawes, 1989). Importantly for the present study Murphy, Brewin, and Silka (1997) distinguished between *denial of psychological autonomy* and *encouragement of behavioural freedom*. The three factor solutions, found independently by these group of authors, are substantially convergent and, as noted by Murphy *et al*., are not in contrast with the original results obtained by Parker. Moreover, according to Murphy *et al*. (1997) the three factors solution permits to explain the connection between parental bonding and psychopathology in a more appropriate manner in respect to the bi-factorial model. The validity of the subdivision of overprotection into denial of psychological autonomy (DPA) and encouragement of behavioural freedom

(EBF) emerged from all the three research groups. Gómez Beneyto *et al*. (1993) found that depression correlated with EBF (Restraint for Gómez Beneyto *et al*., 1993) but not with DPA (Overprotection for Gómez Beneyto *et al*., 1993). Murphy *et al*. (1997) obtained similar results analyzing a feminine subgroup of an English sample of students. Using overprotection sub-dimensions, Cubis *et al*. (1989) found certain gender differences in the parents-children relationship that did not emerge with the two factors solution. In particular, daughters scored higher in DPA dimension (protection-personnel domain for Cubis *et al*.) than sons in fathers' evaluation while they scored lower in EBF than sons in mothers' evaluation. Murphy *et al*. (1997) found that the differences between English and American subjects were clearly more marked using the three factor solution rather than the two factor model. In particular the DPA scores were higher in the American sample while the EBF scores appeared to be higher in the English sample. Lizardi & Klein (2002) showed that a three factor model permits to identify certain relevant associations between parenting behaviours and different types of depression that were not evident using the original two factor structure.

Scinto, Marinangeli, Kalyvoka, Daneluzzo, and Rossi (1999) assessed the psychometric properties of the Italian version of the PBI in a sample of 102 university students and in a sample of 128 patients with mood disorders. They found an adequate internal consistency of the scales and a factorial structure not in contrast with the original two factor model suggested by Parker. In particular they extracted only two principal components with an orthogonal rotation (Varimax) both in the students' sample and in the patients' sample. Successively the authors, using a confirmatory factor approach, compared the two factors model proposed by Parker with the three factor solution of Gómez Beneyto *et al*. (1993) only on the students' group. Since fit indexes were generally rather low and that they were substantially similar for the two models, the authors concluded in favour of the two factor solution. However, in our view the orthogonal method of rotation used, not adequate to highlight correlated dimensions, and the low sample size (N= 102) of the confirmatory factor analysis, do not permit to exclude that the three factor solution is the most appropriate.

Gilbert, Allan, and Goss (1996) broadened the pattern of affectionless control, including in the assessment of the parental style the tendency to debase and humiliate the child (putdown-shaming scale) and the tendency to favour brothers or sisters to the detriment of the subject (favouritism scale). They argued that the PBI care scale did not measure negative signals of shaming/put-down and favouritism which are directly connected to the perceived status of the children and that these dimensions were at least as important as the warmth/care domain (Gilbert, Allan, & Goss, 1996) in predicting depression and other mental disorders.

The aims of the study are to confirm the validity of the distinction between the DPA and EBF sub-dimensions of overprotection and verify the factorial autonomy of the added Gilbert's items; to confirm the well known pattern of correlations between PBI scales and depression on the one hand and extend it to anxiety as a further outcome of children's well-being; and to verify if the added Gilbert's scales increase the predictive power of the PBI original scales on depression and anxiety in the offspring.

METHOD

Participants

Respondents were 1043 young adults, 730 females and 303 males (10 participants did not report their gender) with a mean age of 24.02 (*SD*= 3.19), recruited in successive stages among university students. Paternal and maternal forms of the PBI-E and the BDI were administered to all subjects. Differently, the STAI was filled in only by a subgroup of 417 respondents. Informed consent was requested and obtained from all participants.

Measures

- *Enlarged Version of the Parental Bonding Instrument* (PBI, Parker, Tupling, & Brown, 1979; Parker, 1989; Cappelli & San Martini, 2004, for the Italian version). The parental rearing style was assessed using the original scales of care (12 items) and overprotection (13 items), and also Gilbert's scales (Gilbert *et al*., 1996) of putdown/shaming (3 items) and favouritism (4 items). The format for all items was a 5 point Likert-type scale. Each scale appears in two forms, one for fathers and one for mothers.
- *State-Trait Anxiety Inventory* (STAI Y Form, Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; Pedrabissi & Santinello, 1989, for the Italian version). Trait anxiety was assessed with the trait scale of the STAI-Y form, a widely used inventory containing 20 items that measure enduring symptoms of anxiety on a 4-point Likert scale (from 1 almost never to 4 almost always). The Italian version showed good internal consistencies both in adult and adolescent samples, with alphas >.85.
- *Beck Depression Inventory*. (BDI; Beck, Rush, Shaw, & Emery 1979; Scilligo, 1983, for the Italian version). The BDI was used to assess the presence and severity of depressive symptoms over the last week. The BDI is a 21-item inventory with four response options. The Italian version presented a good internal consistency, (α= .89).

RESULTS

In order to evaluate the dimensional structure of the enlarged version of the PBI, two factor analyses were conducted separately for paternal and maternal items using a principal axis factoring estimation and a direct oblimin rotation. The pattern matrices for the paternal and maternal forms are reported in table 1 and 2.

For the paternal form, the scree test indicated, a five factor model as the best solution, explaining 61% of the variance.

The analysis clearly showed a care factor loaded by all items of the scale, with the exception of item 16 that loaded -.30 on the intended factor and slightly less on the put-down/shaming factor; An overprotection factor, loaded by the items 13, 8, 23, 20, 10, 19, and 9, closely corresponding to Murphy's denial of psychological autonomy (OV_DPA); A second overprotection factor, loaded by the items 22, 21, 3, 25, 7 and 15, closely corresponding with inverted sign to Murphy's encouragement of behavioural freedom and labelled by us discouragement of behavioural freedom (OV_DBF); A favouritism (FAV) factor, loaded by the three items (30, 31, 32) of the corresponding scale; A put-down/shaming (PUT_D) factor, loaded by the four items (28, 29, 26, 27)

Table 1. Pattern Matrix of the Paternal Form of the PBI

	CARE	OV_DPA	OV_DBF	FAV	PUT_D
CARE6	-.78	.13	-.07	-.04	-.05
CARE11	-.78	.01	-.09	.09	.04
CARE17	-.76	-.01	-.02	-.06	.05
CARE5	-.76	-.01	-.09	-.01	-.01
CARE18	-.76	-.04	.04	-.06	.08
CARE12	-.76	.13	-.12	.06	-.12
CARE1	-.75	.11	-.14	.01	-.07
CARE4	-.73	-.08	.07	-.08	-.02
CARE14	-.65	-.26	.10	-.10	.02
CARE2	-.56	-.15	.14	-.05	-.13
CARE24	-.50	-.12	.06	-.03	-.22
CARE16	-.30	-.18	.13	-.14	-.27
OV_13	.08	.70	-.04	-.01	.00
OV_8	.04	.63	.03	.02	-.05
OV_23	-.12	.63	.11	.00	-.06
OV_20	.10	.59	.04	-.03	.13
OV_10	-.03	.59	.10	.05	.10
OV_19	.04	.59	-.02	.02	.05
OV_9	-.07	.55	.22	.02	.10
OV_22	.04	-.03	.83	.04	.01
OV_21	.11	.06	.75	.01	-.02
OV_3	.06	-.01	.74	-.01	.04
OV_25	-.04	.07	.47	.04	-.06
OV_7	.12	.24	.45	.00	.09
OV_15	.01	.25	.45	-.01	.13
FAV30	.03	-.07	.03	.96	-.02
FAV31	.04	-.02	.01	.96	-.04
FAV32	-.06	.05	.04	.64	.17
PUT_D28	.01	.01	-.04	.03	.82
PUT_D29	-.03	.00	.03	.07	.81
PUT_D26	.04	-.02	.05	.01	.79
PUT_D27	.03	.06	-.01	.08	.79

Notes: OV= overprotection; FAV: favouritism; PUT_D= put-down/shaming; DBF= discouragement of behavioural freedom; DPA= denial of psychological autonomy.

of the corresponding scale; Inter-correlations among factors were significant and above medium size, according to Cohen's standards ($r > .30$), except for the correlations between discouragement of behavioural freedom and both Gilbert's dimensions (i.e. favouritism and put-down/shaming) that were of small size ($.10 < r < .30$).

The analysis the maternal form yielded similar results. The scree test indicated again to extract five factors, explaining 64% of the variance.

Also here the analysis clearly showed a care factor loaded by all items of the scale, with the exception of item 16 that loaded -.36 on the intended factor and slightly less on the put-down/shaming factor. An overprotection factor, loaded by the items 13, 9, 8, 23, 10, 20, 7, 19, and 15, sharing with Murphy's denial of psychological autonomy (OV_DPA) seven of its nine items; A second overprotection factor, loaded by the items 22, 21, 3, and 25 that correspond to the first four items of Murphy's discouragement of behavioural freedom (OV_DBF); A favouritism (FAV) factor, loaded by the three items (30, 31, and 32) of the corresponding scale; A put-down/shaming (PUT_D) factor, loaded by the four items (28, 29, 26, and 27) of the corresponding scale; As for paternal form,

Table 2. Pattern Matrix of the Maternal Form of the PBI

	CARE	OV _DPA	OV _DBF	FAV	PUT_D
CARE6	-.80	.03	-.02	.01	-.04
CARE12	-.75	.10	-.06	.04	-.13
CARE 1	-.73	.09	-.13	-.02	-.02
CARE18	-.71	.05	-.06	-.04	.04
CARE11	-.69	.01	-.02	-.04	.08
CARE5	-.68	-.17	.00	-.04	.06
CARE2	-.66	.00	.05	-.08	-.12
CARE17	-.65	-.03	-.03	.02	-.06
CARE14	-.61	-.27	.02	-.03	.02
CARE4	-.50	-.11	.10	-.05	-.18
CARE24	-.44	-.03	-.01	-.03	-.25
CARE16	-.36	-.01	.08	-.11	-.35
OV_13	-.02	.75	-.07	.02	.02
OV_9	.02	.71	.13	.03	-.06
OV_8	.09	.71	-.14	.05	-.01
OV_23	-.17	.64	.09	-.03	.10
OV_10	.07	.64	.08	.04	.04
OV_20	.08	.54	.05	.00	.16
OV_7	.13	.54	.21	-.01	-.05
OV_19	.04	.46	.04	.04	.15
OV _15	-.02	.46	.28	.03	.02
OV_22	.02	-.05	.84	-.02	.02
OV_21	.13	.12	.74	-.02	-.04
OV_3	.09	.15	.53	.03	-.05
OV_25	-.02	.01	.43	.11	.12
FAV31	.03	.00	.01	.96	-.11
FAV30	.03	-.03	-.02	.96	-.03
FAV32	-.06	.04	.05	.58	.21
PUT_D29	.04	.02	.06	.06	.78
PUT_D28	.08	.09	.00	.03	.72
PUT_D26	.06	.02	.05	.02	.70
PUT_D27	.08	.14	.00	.07	.67

Notes: OV= overprotection; FAV: favouritism; PUT_D= put-down/shaming; DBF= discouragement of behavioural freedom; DPA= denial of psychological autonomy.

inter-correlations among factors were significant and above medium size, according to Cohen's standards (r >.30), except for those between discouragement of behavioural freedom and both Gilbert's dimensions (i.e. favoritism and put-down/shaming) that were of small size (.10 < r <.30).

Overall, these results support the relative independence of Gilbert's scales and justify their inclusion in a comprehensive instrument aimed at measuring the parental rearing style. They further confirm that the distinction between two overprotection sub-dimensions, as proposed by Murphy *et al*. (1997), is appropriate. Thus, in this enlarged version, the PBI comprises five factorial scales, care (12 items), favouritism (4 items), put-down/shaming (3 items), denial of psychological autonomy (7 items) and discouragement of behavioural freedom (4 items). The last two scales contain only items loading saliently on the relevant factor in both paternal and maternal forms, with the exclusion of item 7 (i.e. liked me to make my own decisions) and 15 (i.e. Let me decide for myself), that had their highest loadings on OV_DPA in the paternal form (as emerged in Murphy's study) but on OV_DBF in the maternal form.

In table 3 are presented both descriptive statistics and internal consistencies, showing an adequate level of Cronbach's Alpha and a close to normal distribution for all the scales. Small though significant gender effects for some of the scales are worth noting: for instance, interestingly, in both parental forms females scored significantly higher than males on discouragement of behavioural freedom scale (for the paternal form t_{1025}= 3.58, p <.001; for the maternal form t_{1030}= 3.57, p <.001), but not on denial of psychological autonomy, confirming the relevance of the distinction between two facets of overprotection.

The maternal and paternal forms were substantially correlated: for care r= .40 (p <.001), for denial of psychological autonomy r= .57 (p <.001), for discouragement of behavioural freedom r= .45 (p <.001), for favoritism r= .47 (p <.001) and for put-down/ shaming r=.52 (p <.001). These correlations may indicate a genuine similarity of rearing styles within married couples, but they may also reflect a subjective interpretation of the children about the rearing style they received.

As expected depression and anxiety were negatively correlated with care and positively with all other PBI-E scales (table 4). In particular, correlations of both paternal and maternal forms with depression and anxiety were between small and medium according to Cohen's standards, except for OV_DBF that showed r values ranged from zero to small.

Table 3. Descriptive Statistics.

		Mean	*SD*	Skewness	Kurtosis	Alpha
Paternal form	CARE	1.79	.77	-.25	-.52	.924
	OV_DPA	.95	.69	.75	.20	.847
	OV_DBF	1.47	.79	.03	-.66	.815
	FAV	.53	.79	1.53	1.52	.899
	PUT_D	.54	.74	1.40	1.25	.904
Maternal form	CARE	2.04	.60	-.83	.09	.923
	OV_DPA	1.21	.75	.38	-.57	.884
	OV_DBF	1.47	.73	.12	-.61	.775
	FAV	.71	.86	1.13	.35	.878
	PUT_D	.53	.70	1.46	1.65	.889

Notes: OV= overprotection; FAV: favouritism; PUT_D= put-down/shaming; DBF= discouragement of behavioural freedom; DPA= denial of psychological autonomy.

Table 4. Correlations of the PBI scales with depression and anxiety

		BDI	STAI
Paternal form	CARE	-.30	-.33
	OV_DPA	.16	.35
	OV_DBF	.07	.12
	FAV	.25	.36
	PUT_D	.24	.32
Maternal form	CARE	-.26	-.27
	OV_DPA	.27	.34
	OV_DBF	.12	.13
	FAV	.34	.36
	PUT_D	.30	.34

Notes: OV= overprotection; FAV: favouritism; PUT_D= put down/shaming; DBF= discouragement of behavioral freedom; DPA= denial of psychological autonomy; BDI= Beck Depression Inventory; STAI: State-Trait Anxiety Inventory.

In order to test the incremental validity of Gilbert's scales (favouritism and put-down/shaming) in paternal and maternal forms for both depression and anxiety, four hierarchical regression analyses were conducted, including, at the first step, CARE, OV_DPA and OV_DBF and, at the second step, FAV and PUT-D. For the paternal form the inclusion of Gilbert's scales in the equation (step 2) produced a significant increase of explained variance, both for depression (R^2 change= .02 ; F change= 10.65, p <.001) and anxiety (R^2 change= .02 ; F change= 6.17, p= .002). Similarly for the maternal form, the inclusion of Gilbert's scales produced a significant increase of the explained variance, again both for depression (R^2 change= .05; F change= 31.10, p <.001) and anxiety (R^2 change= .05; F change= 11.35, p <.001).

These results support the incremental validity of paternal and maternal Gilbert's scales for the prediction of depression and anxiety.

DISCUSSION

In accordance with Murphy, Brewin, and Silka (1997), the factor analysis on the original items suggested a three factor solution as the most appropriate, with one care and two overprotection factors (i.e. denial of psychological autonomy and discouragement of behavioural freedom). On the basis of the item contents, DPA, more than DBF, refers to a disconfirmation of the children's abilities by the parents and thus to a lack of mirroring in the parental rearing style (Kohut, 1971) whereas DBF is more directly related to the limits and prohibitions that parents consider desirable as rules of life, thus implying a limitation of freedom for the child but not a devaluation of its abilities and, as a consequence, of its attractiveness. This interpretation of the scales may explain the correlations of DPA with anxiety and depression that were found to be higher if compared with DBF ones. In fact, a lack of mirroring in the parents may suggest to the children that they have an insufficient status in the family-group (Gilbert, Allan, & Goss, 1996), inducing them to develop a fragile self-esteem and thus higher scores on depression and anxiety. Differently, parental rules that only limit children's freedom, may affect children's relationship with the authority rather than their perceived status in the family-group. In order to test the pathogenic impact of DPA on children's vulnerability in respect to DBF, further studies may be conducted, comparing pathological and non pathological subjects. An examination of the difference between these groups in the pattern of means on DPA and DBF may confirm the theoretical interpretation illustrated.

As regards Gilbert's scales, although significantly correlated with care and overprotection, favouritism and put-down/shaming showed an adequate factorial autonomy that justify their use jointly with the other PBI scales. There were only two items that have been eliminated from PBI-E because they did not fit with the five dimensional pattern. Further studies using a confirmative factor analysis approach may be useful to confirm the dimensionality emerged, supporting in this manner the construct validity of Gilbert's scales.

The observed pattern of relations of PBI-E scales with children's depression and anxiety further support Parker's theory on the pathogenic effects of affectionless control. Moreover, our data showed that Gilbert's scales inclusion substantially enhances the predictive power of the instrument on both depression and anxiety. In future studies, to give further support to PBI-E criterion validity, it may be useful investigating the predictive power of PBI-E and the incremental validity of Gilbert's scales on many other psychopathological dimensions using for instance those measured by acknowledged and widely spread diagnostic instruments such as MMPI-2 (Ben-Porath & Tellegen, 2008) or SCL-90 (Derogatis, 1992).

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